

Pathways to central heating: insights and lessons from past transitions

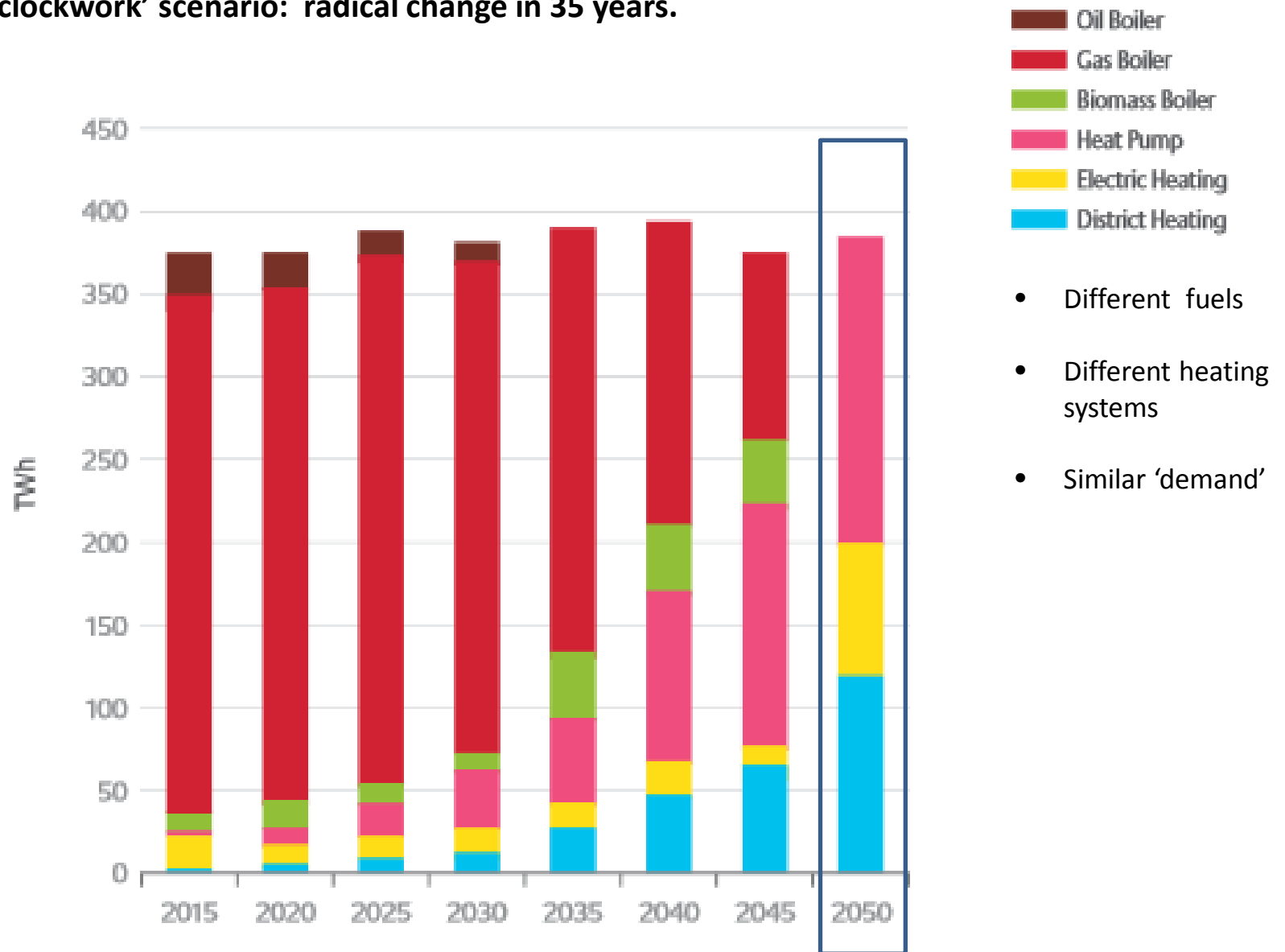
Elizabeth Shove and Nicola Spurling, Lancaster University

Matt Watson and Lenneke Kuijer, University of Sheffield

Frank Trentmann, Birkbeck and Anna Carlsson Hyslop, Manchester University

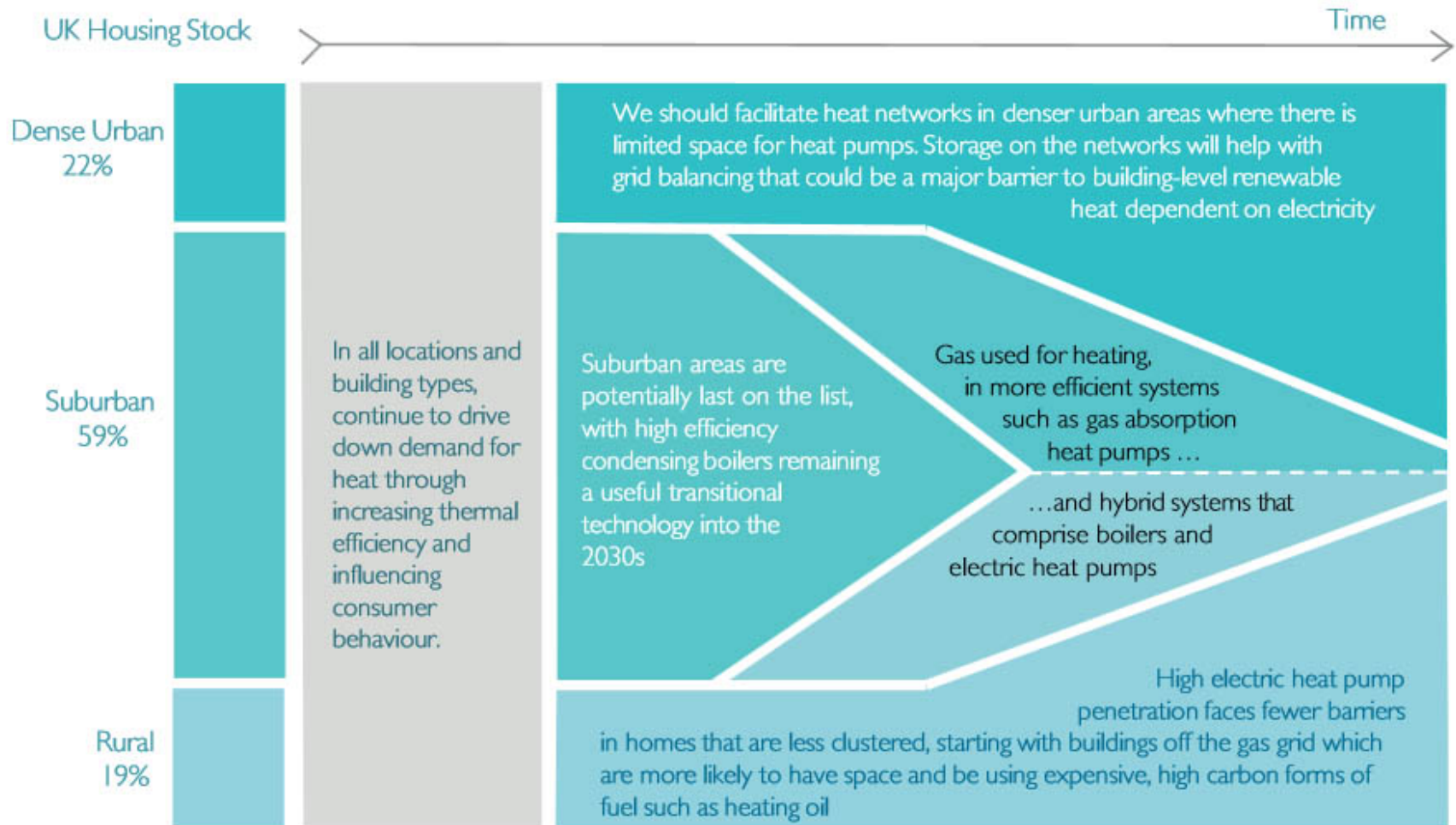
Looking ahead

ETI's 'clockwork' scenario: radical change in 35 years.



Scenarios for arriving at this scenario

Figure 7: Updated strategic framework for low carbon heat in buildings over time



Source: DECC

Looking back

Insights

from a previously radical 'transition' in heating:
from solid fuel to gas central heating: 1930s- 1990s

Questions

How do infrastructures, fuels, appliances and practices co-evolve?

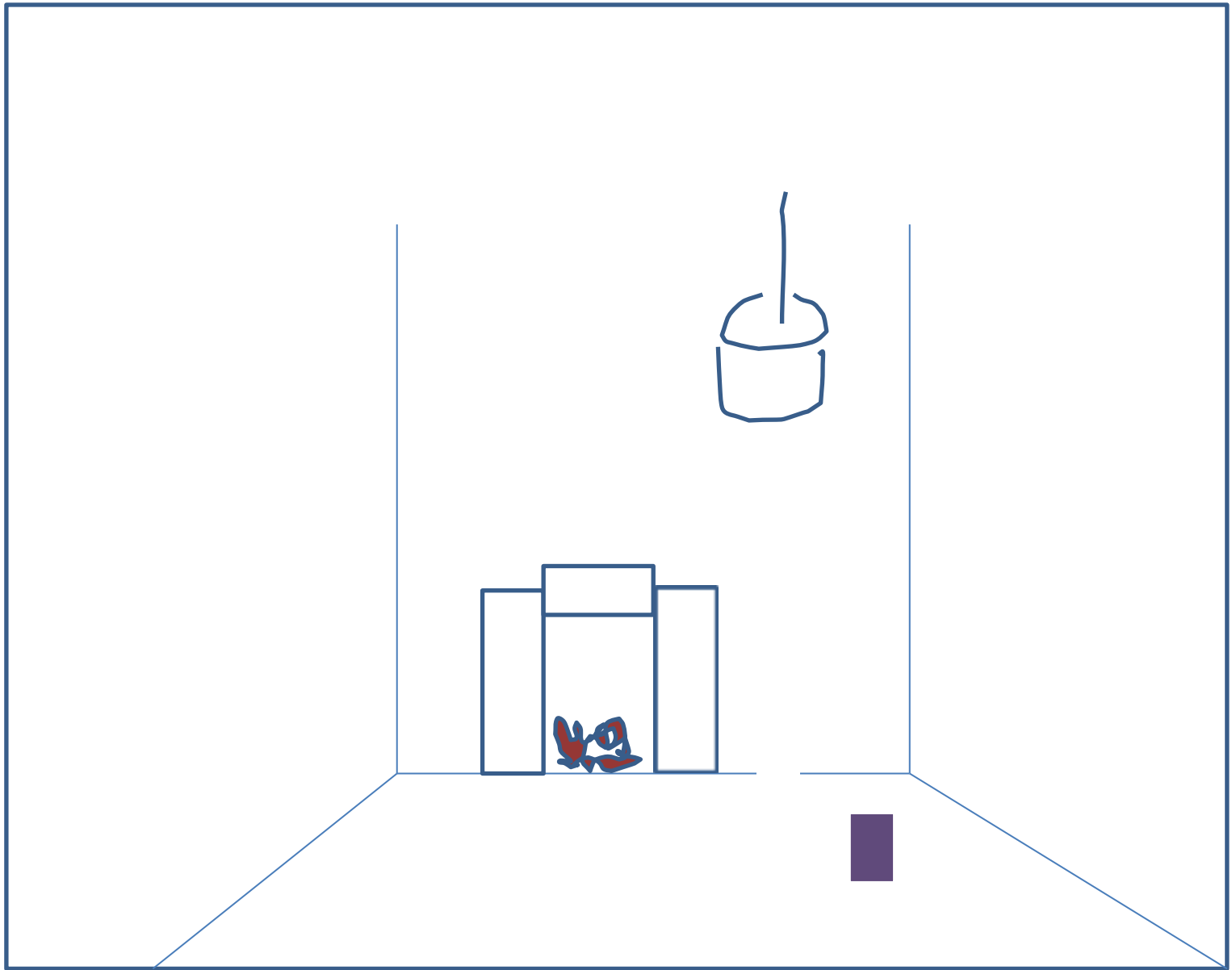
How are systems and technologies added, combined and removed from homes built at different times?

How are methods of keeping warm intertwined with the rhythms of daily life, with what people do in their homes and with how spaces are used

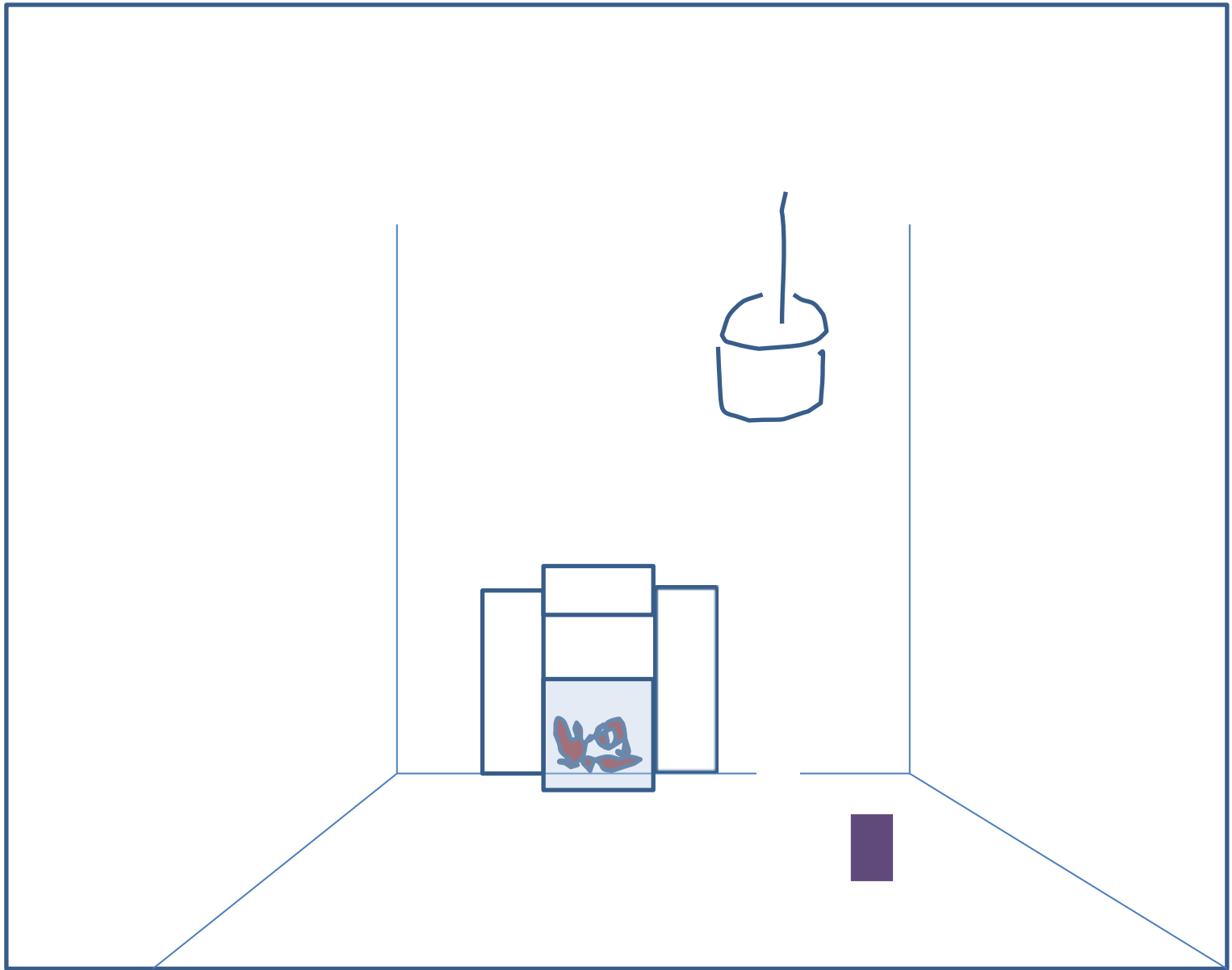
How do standards and conventions of 'normal' provision change?

Policy relevance

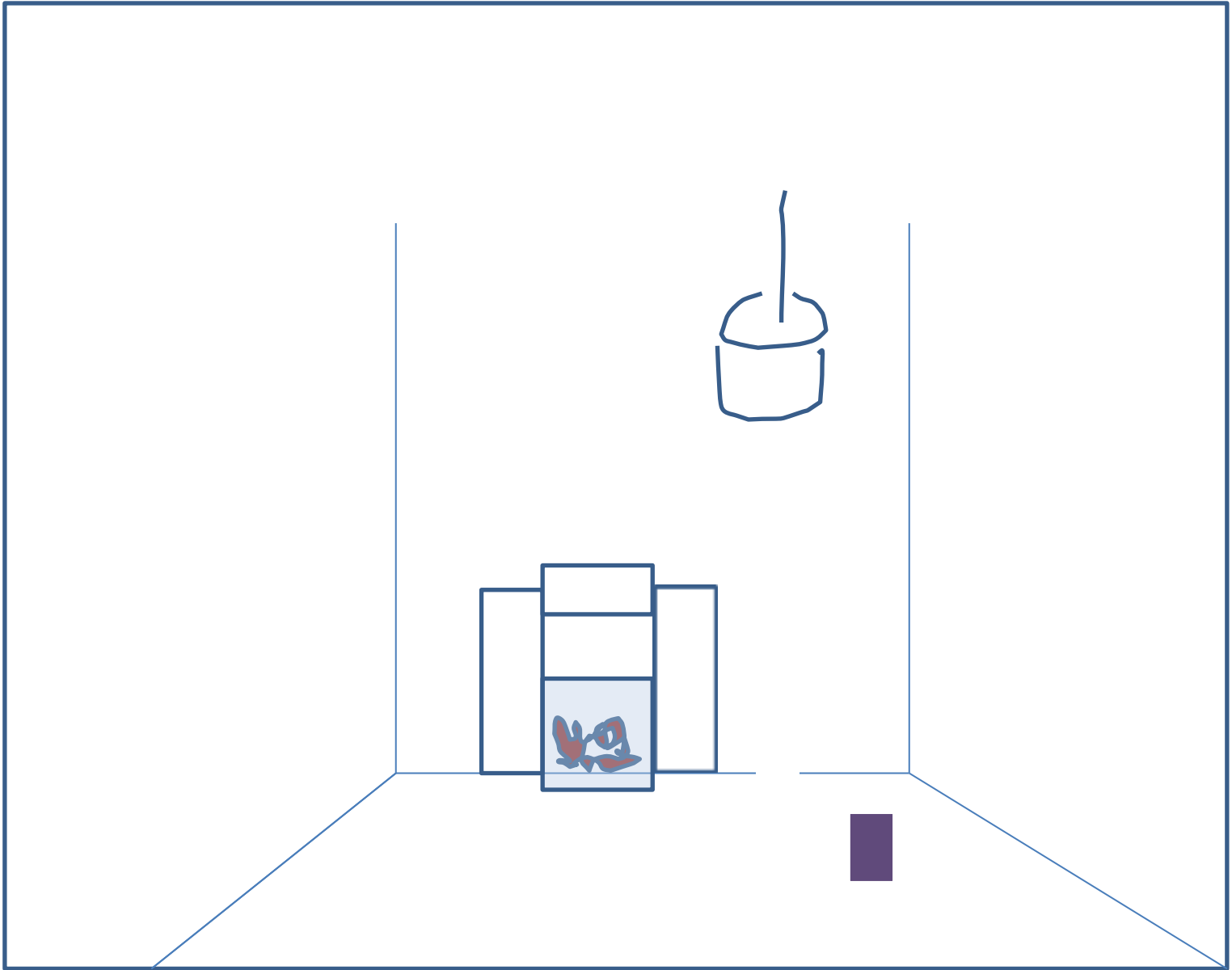
To be discussed



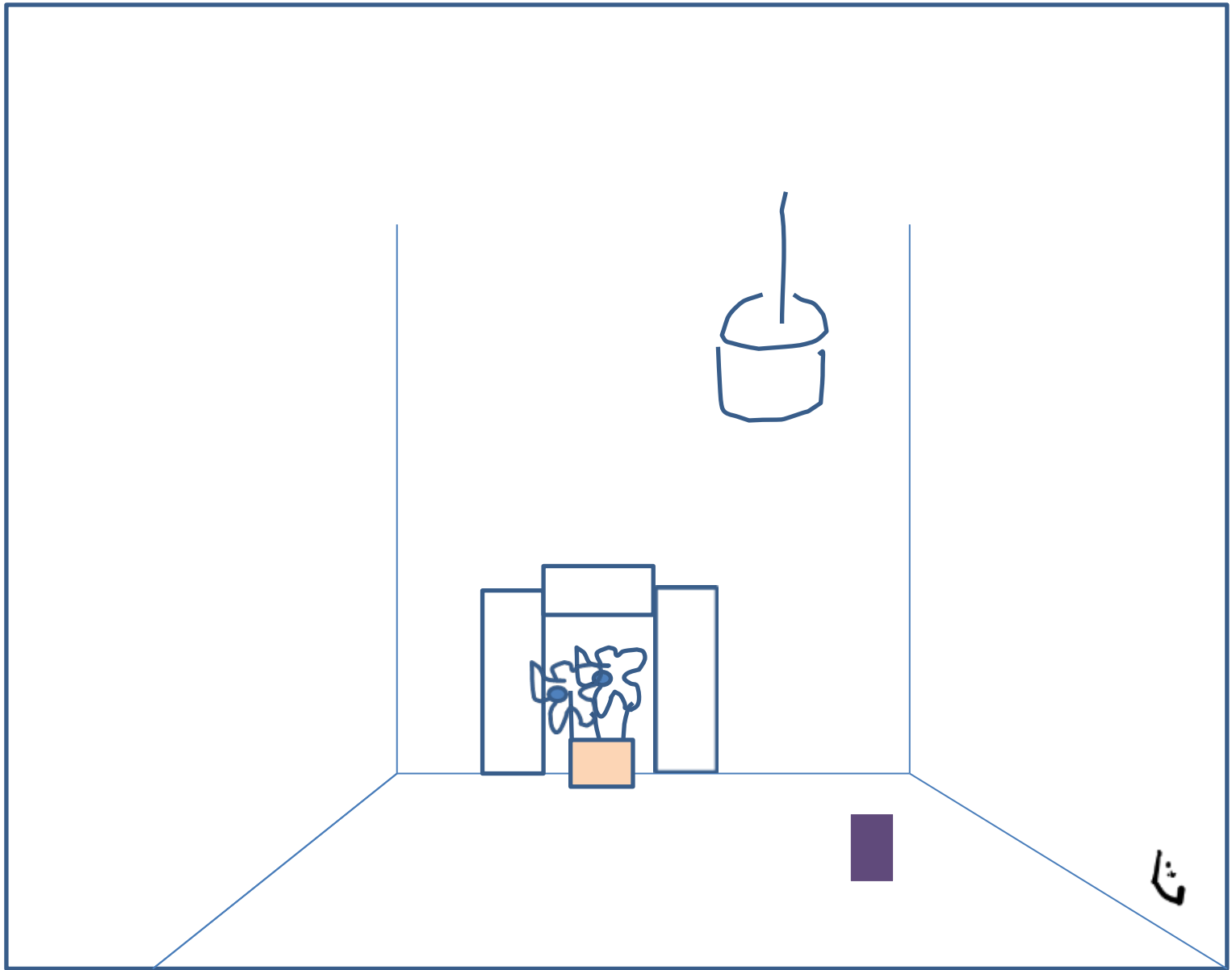
In outline



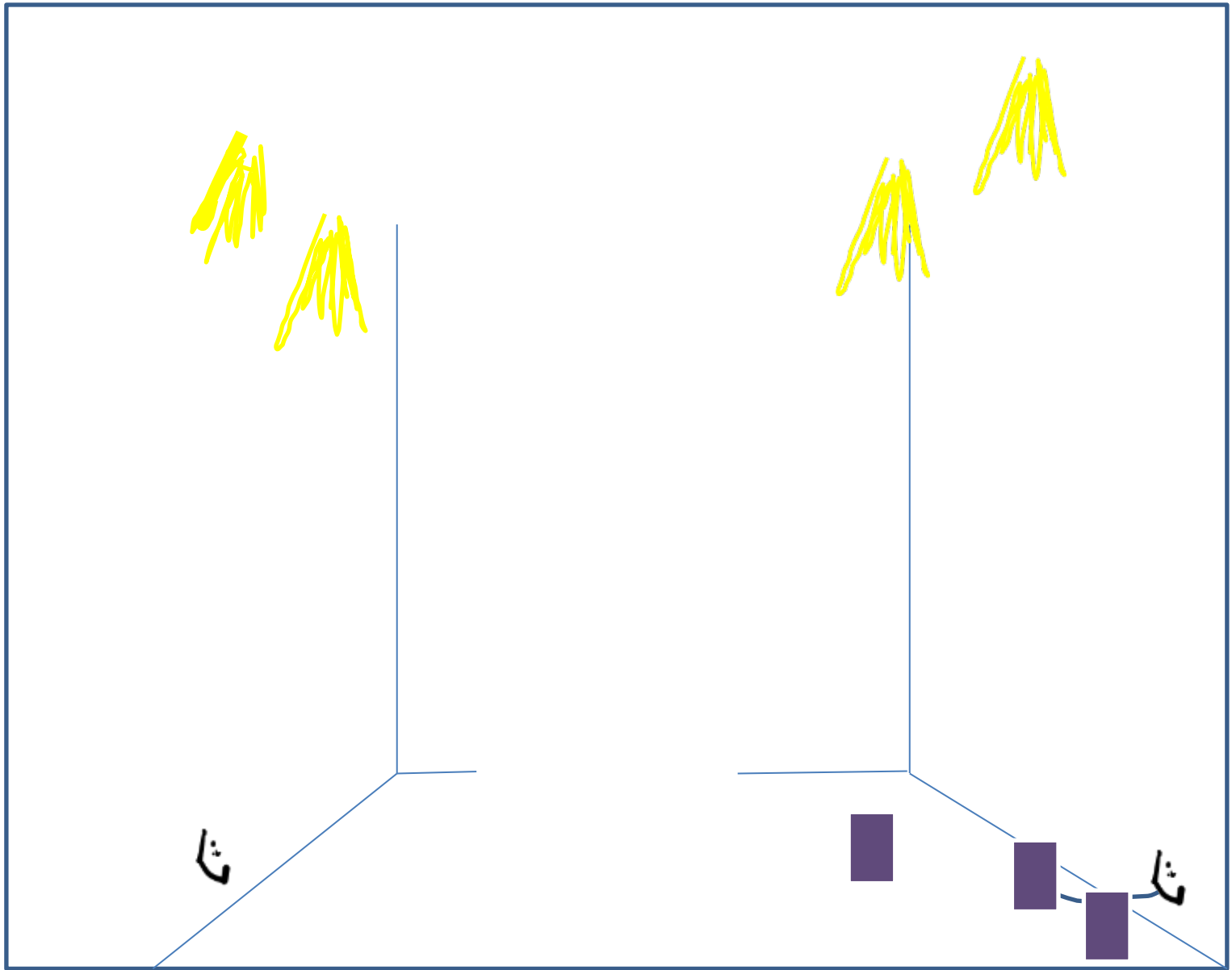
In outline



In outline



In outline



In outline

This time-lapse sequence provides a misleadingly **generic, linear, technology focused** account

It does not tell us:

- How people lived in those homes, at those different points in time
- How combinations of infrastructure and practice develop (trends, periods and rates of change)
- How infrastructures, meanings and methods of keeping warm develop together

Pathways are shaped by overlapping histories. There is no single narrative.

- Fuels, heating systems, 'standards', and patterns of ownership and provision
- Interventions in the life of a building: design, adaptation, renovation
- The changing experiences of people/households across the life course

Methods of revealing these multiple heating lives

SITES

Two locations: Stevenage (late 1950s, planned) and Stocksbridge (1920s): council housing, plus review of London housing surveys over the same period.

ARCHIVE MATERIALS

Show what was provided as 'normal', when and why this changed and how people responded to new systems.

ORAL HISTORIES

with people who have lived in the housing estates represented in the archive; or who are living in these houses now provide further insight into how infrastructures are adapted and used in practice.

But ways of living change over the life course: having children or not, working or not etc. And people move house. To take account of these features we

SELECTED RESPONDENTS

Who are of different ages today (between 50 and 90), but mostly focused our

QUESTIONS

Mostly focus on the period when respondents were between 25-35. Keeping warm in winter, heating water and doing the laundry.

Who we spoke with

Years discussed in detail	Stocksbridge	Stevenage
1940s	Now aged 80, 90	
1950s	Now aged 90, 88, 65	Now aged 72
1960s	Now aged 88, 80, 77, 65	Now aged 80, 76, 75, 72, 66
1970s	Now aged 88, 77, 71, 70, 65, 58	Now aged 76, 72, 66, 62, 57
1980s	Now aged 83, 71, 70, 66, 65, 58	Now aged 62, 62, 60, 60, 57
1990s	Now aged 66, 58	Now aged 60, 44, 39
2000s		Now aged 51, 38, 38
	15 in total	11 in total

Some interviewees spoke about more than one decade

Technologies and fuels: space heating and heating space

1940s

Solid fuel, coal, logs: one room heated, fireplaces in other rooms rarely used.
Cold or snug depending on location and time of day

1950s, e.g. Stubbin farm estate, Stocksbridge

Solid fuel but Parkray stoves, plus radiator. Gas fire in second downstairs room. 4 x 15 amp sockets.

1960s e.g. East Whitwell estate, Stocksbridge

As above but with 'top up' heaters: electric bars in the bathroom, paraffin heaters, convector heaters, electric blankets.

1960s-1970s: adaptations

Many combinations: parkray, parkray plus radiators, gas fire, gas fire plus radiators, storage heaters (especially in the hall)

1970s-1980s: adaptations

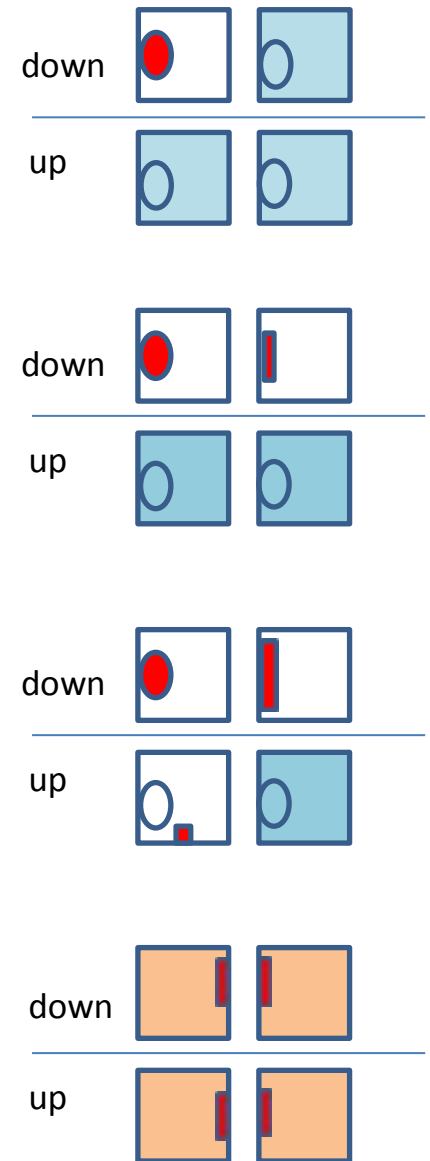
Open grate replaced with gas central heating and radiator in every room, but not always used.
Double glazing added. Duvets arrive from the Continent, blankets disappear. More rooms in use: reading in the bedroom, less clothing worn. Many more power sockets.

Heating creeps around the home

Heating matters for how homes are used

Heating matters for the details of daily life

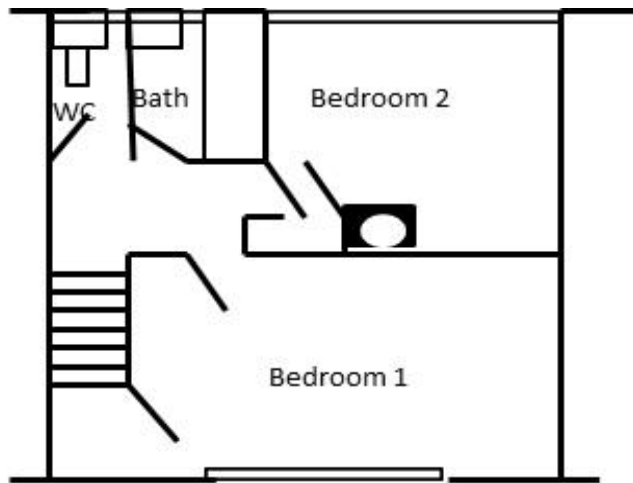
Heating systems are used in different ways



Simplified house plans showing heated space over time

The home and how it is adapted

Information from council archives combined with oral history data allows us to track the life of an individual house and reveal ongoing adaptation.



The life of a house type

1960 Stevenage, B24

As designed

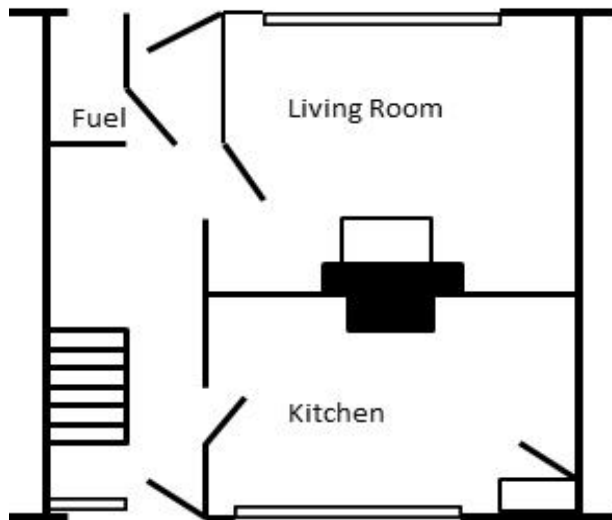
solid fuel fire in lounge

back boiler

radiator in kitchen

gas/electric cooker

a few electric sockets (unclear)



Fuel store

B24: as adapted in the 1970s

Removed radiator in kitchen

Gas fire in lounge

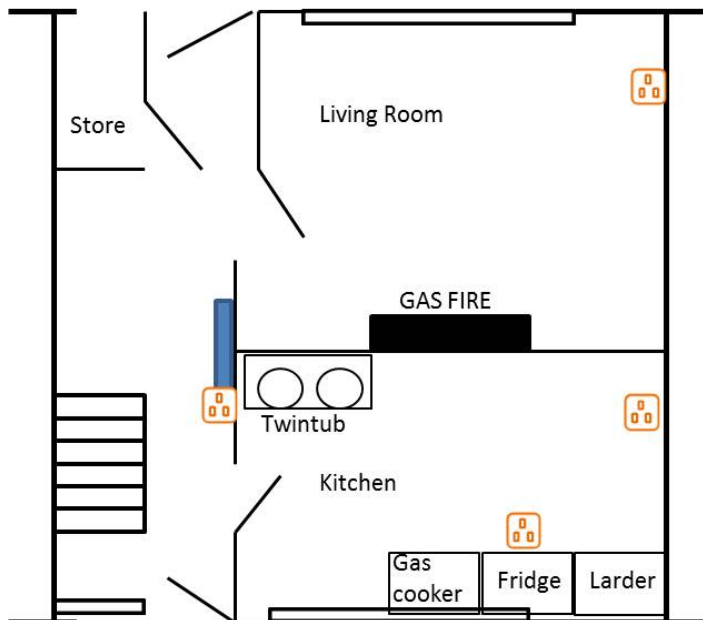
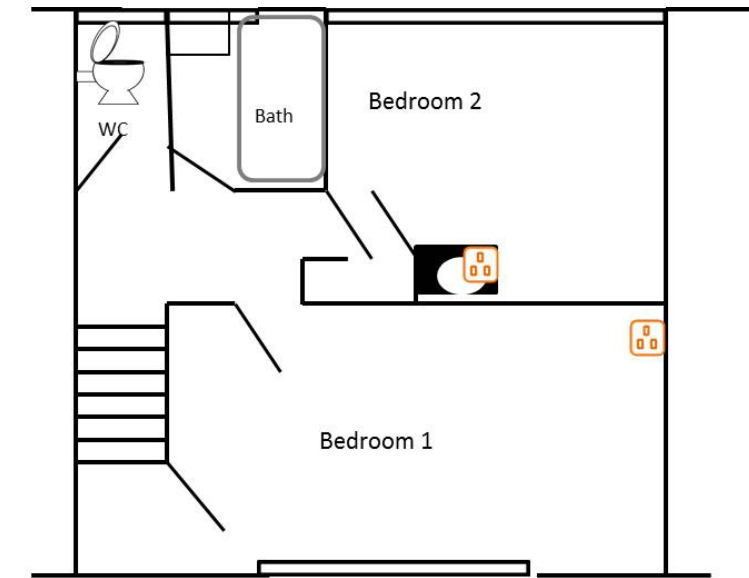
Immersion heater

Storage heater in hall, and sometimes on in each bedroom as well.

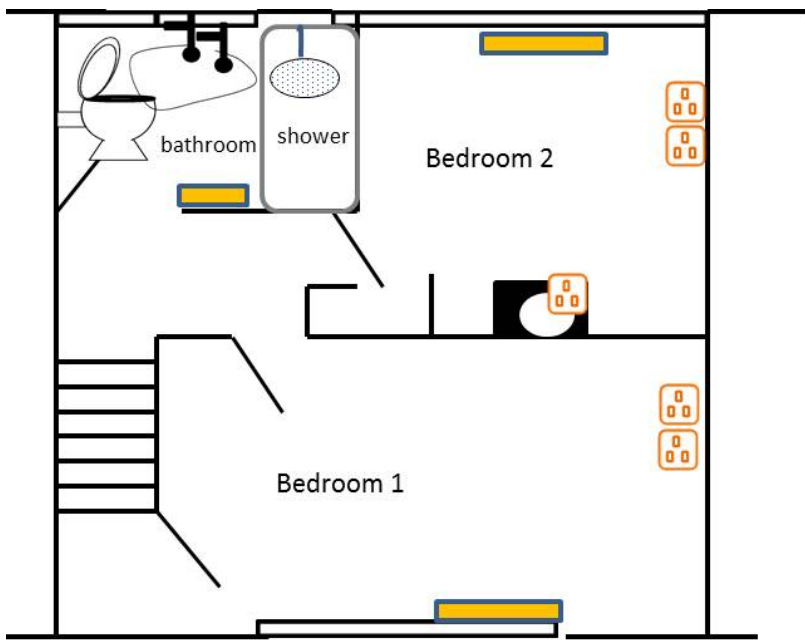
twin tub washing machine

larder cupboard & fridge

Electric sockets in lounge and kitchen

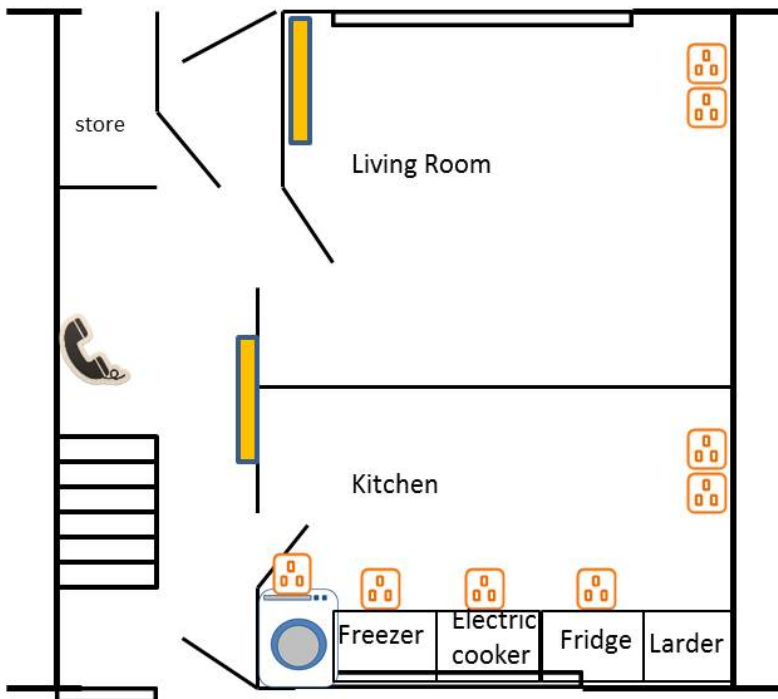


Electric socket

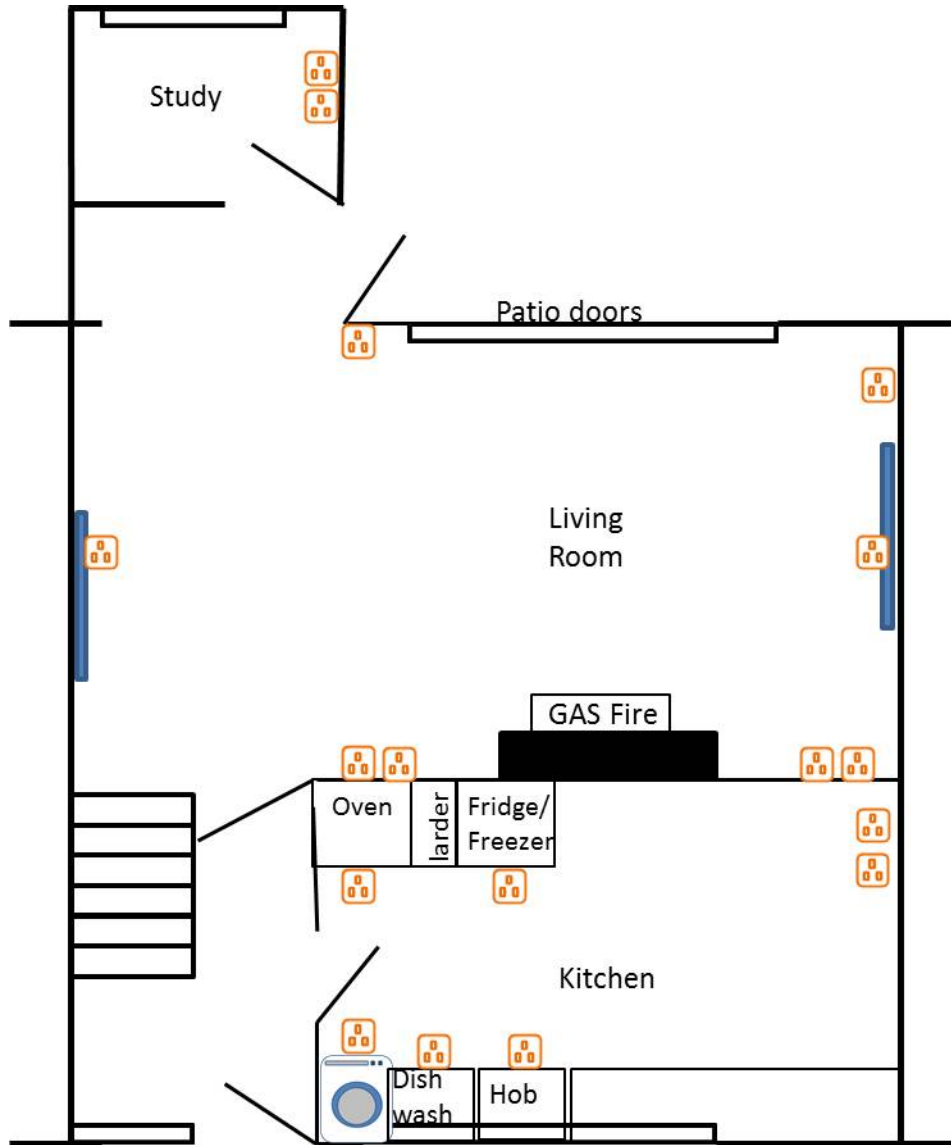


B24: as adapted in 1983

Radiators throughout (gas central heating)
 Electric sockets provided throughout
 Double glazing
 fridge, freezer, electric cooker, automatic
 washing machine



Bathroom (knocked into 1 room) with
 shower



B24 as adapted in 1992

Storage heaters in the living room & bedrooms

Electric sockets provided throughout
 Double glazing
 fridge, freezer, electric cooker,
 dishwasher, automatic washing machine

Bathroom (knocked into 1 room) with shower.

2 bedrooms converted to 3.

Downstairs knocked through and extended into the brick built store.

Heating and the details of daily life

Accounts of central heating vary depending on when it arrives in peoples' lives, and on their previous experiences.

- a) The experience of heating **all rooms** of a home to a similar temperature
- b) The experience of using fuels that **do not require work** – storage, cleaning, lighting
- c) The **changing relationship** between cooking, space heating and hot water

Heating enables and also follows other changes in what people do.

- E.g. the role of the kitchen, what happens in the living room, what is a bedroom for?
- E.g. the significance of other spaces: the larder, the store.

Upstairs is another world

One coal fire: unheated bedrooms

Eiderdowns and blankets, Pyjamas, no duvets, hot water bottles; plates heated in the oven to warm the bed, bed socks, electric blanket: **other technologies of keeping warm**

*Well we used to have blankets. I mean we could have four or five blankets and you had this weight on you, you know they were wool blankets, and sheets, so when the **duvets** came in it was really funny at first because you didn't think that you had anything on you. You know after having all this weight in bed, and then you didn't need all these electric blanket on because they were really nice and warm the duvets.*

*You couldn't afford to use them [electric heaters] all the time. I mean it were warm **downstairs** but we couldn't all live downstairs.*

Previously separate rooms **knocked through** with the arrival of central heating

Central heating and that knocking it through and I think they did some work in the kitchen as well, making that bigger. - space



Television and space heating: TV in front room

She had a fire like that, a plug in thing. Yeah she'd say 'I'm not putting the [coal] fire on for you to just watch telly for an hour'.

Well I mean everything happened in the kitchen in those days. You virtually lived in the kitchen. Rarely did you put a fire on in the living room, but there was an open fire in the living room as well. You really didn't live in the living room because there were no tellies ...

1953, that's when got our first telly, so that's when we started using the living room, you only used it for parties and Christmas if that.

Conjunctions of space, heat and TV



<http://media.ofcom.org.uk/files/2013/07/1950s-Family-blank-lo-res.jpg>

Seasonal arrangements

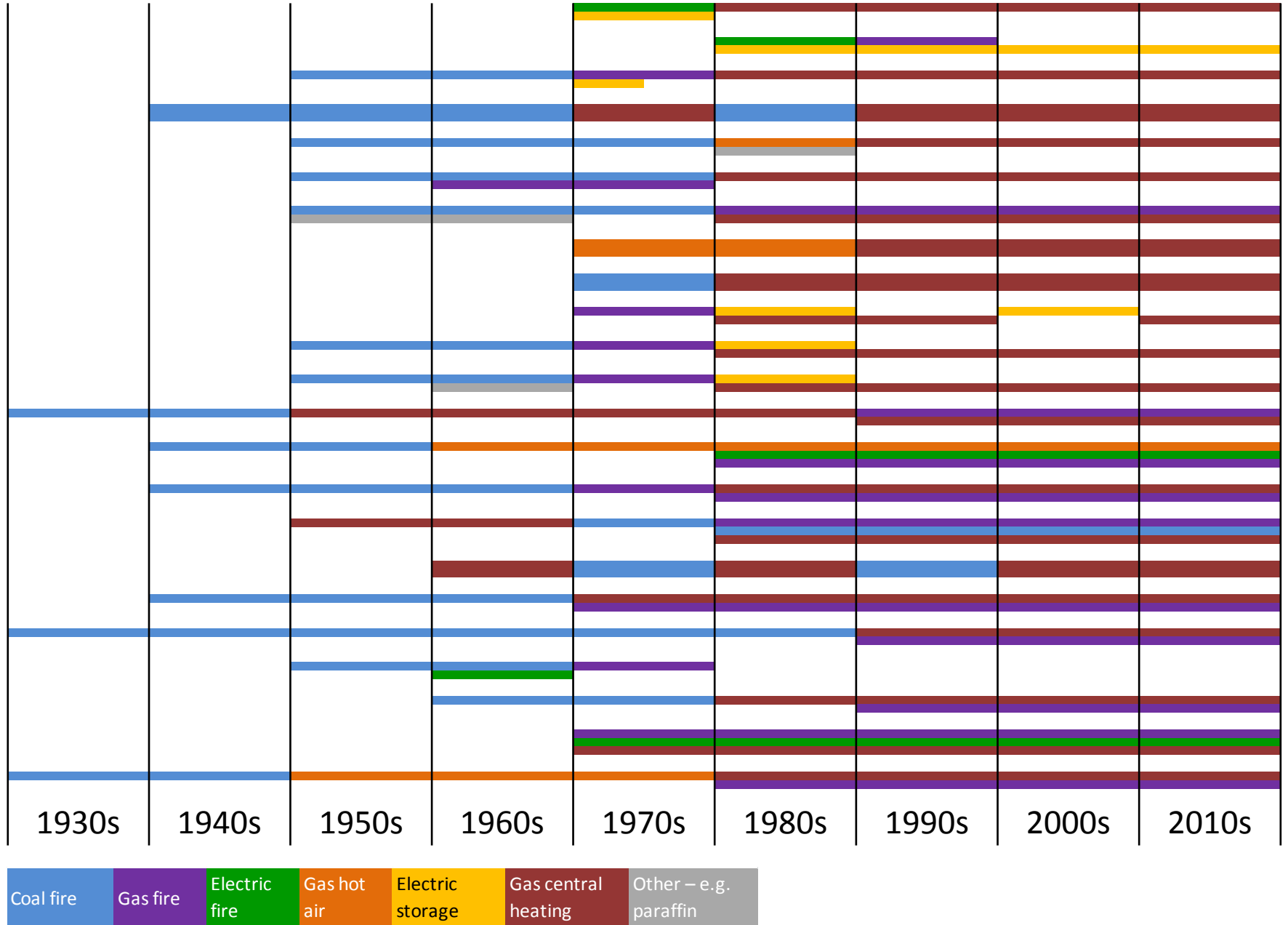
Generational arrangements

Yeah we used to wear vests. I forgot about them, I mean we don't wear vests nowadays. Yeah we used to wear vests of course.



<http://www.ebay.co.uk/itm/Vintage-spencer-vest-Ladys-1950s-wool-lacy-underwear-SNUGGIES-Arachne-UNUSED-/400774301461>

Each row represent one respondent's experience



Infrastructures in use

Stocksbridge, female born 1937

- Grew up in Wales in 1940s, had **single coal fire** and at some point ample coal supply through father's job as a miner.
- Moved to Stocksbridge in late 50s and lived with family and inlaws for a while
- After marriage moved to cottage with coal fire and lived there for four years
- Moved into East Whitwell estate in **1964 to a house with hot air central heating**
- **Closed off pipes** leading upstairs, used additional heating like electric blanket, hot water bottle but later bedsocks
- Still lives in the house today with same central heating system.
- **Does not use it for upstairs** but uses small gas heater on stairs and electric heater in bathroom instead.

Stocksbridge, male born 1943

- Grew up in home with Yorkshire range, **heating only in kitchen**, in 40s/50s
- Moved into current home in 1967 after marriage
- Had single coal fire for first two years while both working
- **Installed gas fire** to replace coal fire when wife **pregnant with first child** in 1969, supplemented with electric heaters and electric blanket upstairs
- Installed **central heating when wife pregnant with second child**
- Removed radiator in kitchen because got too warm
- Installed new boiler and moved it from kitchen to office next to kitchen
- **Central heating is now kept at around 22** degrees and regulated with thermostat and radiator valves

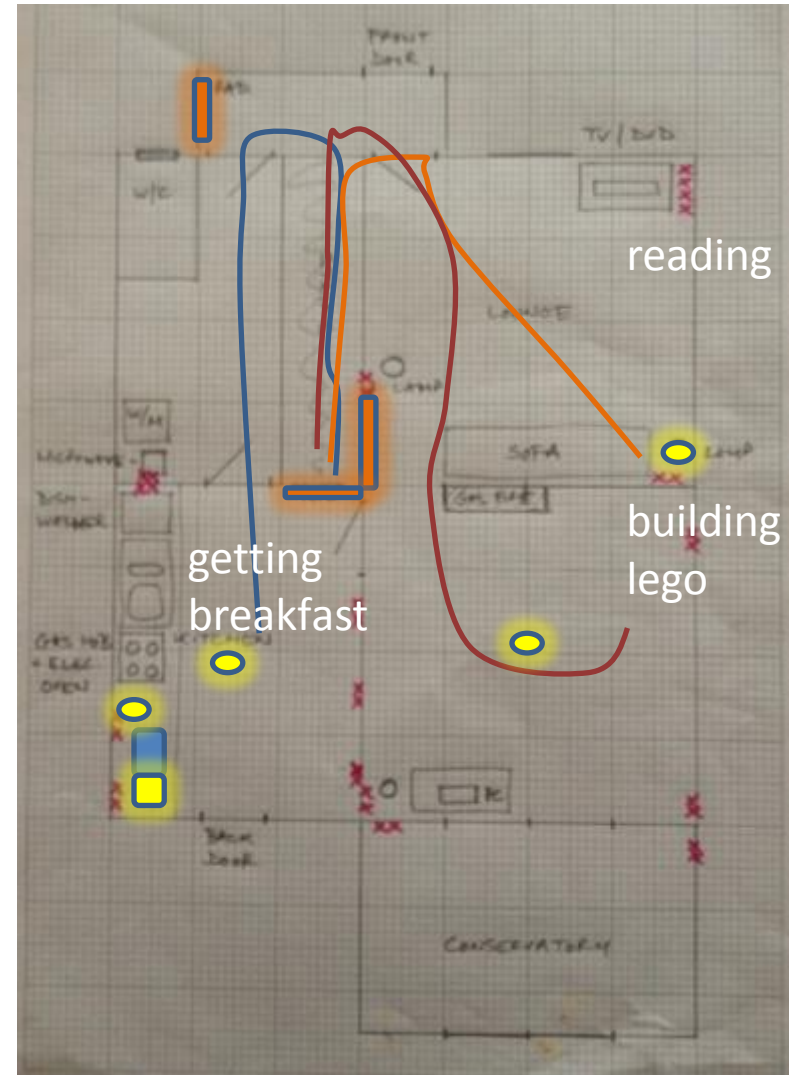
People move between different heating systems

Not all heating systems are used: other technologies continue to have a role

Heating systems and daily rhythms: patterns of on, off, here and there

6:45am

7:30am



Different forms of enquiry and angles of analysis reveal different aspects

- Keeping warm across the decades: shared features of provision
- The heating infrastructure/system of a specific house/house type
- Keeping warm across the life course: personal histories

Places of practice: within the home, spatial bundles and how these change – e.g. one room, upstairs, downstairs

Rhythms of practice: working hours, week ends, seasons.

Adapting heating: Coexisting systems, patchwork of space and person heating; ‘full central heating’ provision, but not use. Multiple options, other technologies – blankets, hot water bottles, vests are in use today.

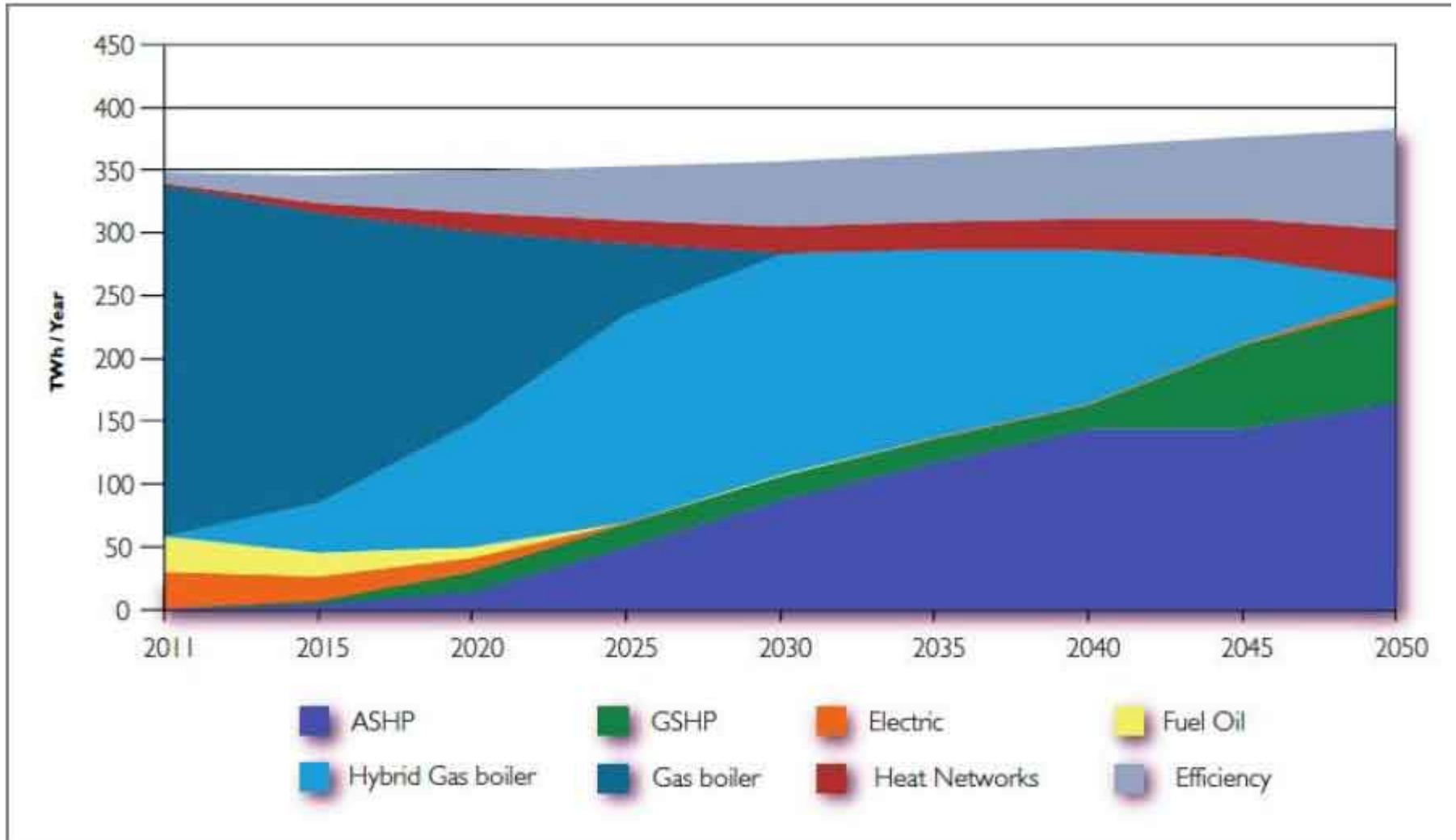
Adapting space: larder to refrigerator, TV and place to watch it, more power sockets, knocked through rooms.

Infrastructures planned/provided: Changing notions of ‘normal’ council provision: full central heating becomes the standard.

Standards: standards of living, standards of provision

So what does this mean for the future?

How might future projections work out in daily life?



UKERC, UK energy strategies under uncertainty
Nick Eyre, Pranab Baruah 2014

Heat Networks

A district heat network involves connecting households in a local area to a central heat source via a hot water pipeline. Within each household, a heat exchange unit extracts the heat from the central pipeline into an internal hot water system.

Heat networks offer strategic flexibility by allowing interchangeable sources of heat with minimal disruption to households.

Currently, heat networks account for a very small share of the UK heat market, around 1-2% compared with e.g. 60% in Denmark.

Enable something like ‘full’ central heating

ETI: Options, choices, actions: p57

Heat pumps

For households in less built-up areas, heat pumps can form the basis of a low carbon heating system in the home, as part of a wider retrofit package. Our analysis suggests that the optimal package could include improvements to walls with external or internal insulation, loft insulation, floor edges, improved airtightness, as well as heat storage and peak backup to support the heat pump. The operation of the heat pump, backup and storage will be controlled by a Home Energy Management System (HEMS).

ETI, p57

Lower power heat pumps can’t respond fast: background heat and back up (e.g. parallel gas system, or electric heating), plus insulation

Differences in urban, rural and suburban modes of heating

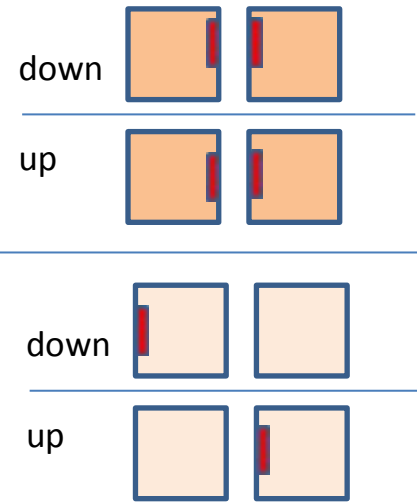
The future of heating, DECC, 2013

Figure 7: Updated strategic framework for low carbon heat in buildings over time



Source: DECC

Heat networks: total space heating at 22° C.



Heat pumps: background and top up heating
Either gas, electric, or solid fuel (wood).

The rapid disappearance of gas central heating: future fiction?

Stocksbridge, female born 2000

- Grew up in Stocksbridge, with **gas central heating**.
- Moved to a new house in 2030 having lived with inlaws for 10 years.
- First experience of **air source heat pump** and electric **storage heaters**.
- Uses the latest range of **merino body wear*** an electric blanket, and a new style portable **radiant heater**.
- Moves the heater around to top up background heat.
- Likes the 'thermal delight' of snuggling under the high tog duvet.
- Has **disabled the control system** which doesn't recognise the complexity of her working life.

Stevenage, male born 2015

- Grew up in Stevenage, in a B24, with **gas central heating** that was first installed in 1969
- Lived in rented accommodation and has experience of all manner of heating systems.
- Spent 5 years in Birmingham in a flat that had **district heating**.
- Now back in a house with **gas central heating** – defying the predictions.
- Quite fancies moving to a place in the country with an **ordinary wood burning stove**.

* subsidised by the government

Conclusions and implications

The future of heating relates to: future uses of space in the home; temporal rhythms; an ecology of other technologies (clothing, hot water bottles, duvets).

The future of heating is shaped by the past and the present: current standards of 'full' central heating, open plan rooms, a notion that 18-22°C is normal and an expectation of rapid response are important – even if the reality varies widely.

The future of heating relates to systems of provision; housing standards; councils and other actors, and beyond them, infrastructures, gas networks, grids etc.

Heat pump scenarios:

Reintroducing the concept of background heating; different temporalities; 'rural' versions of warmth. Lots more insulation in an effort to reach the 'gold standard' of always on full central heating.



Heat network scenarios:

Sized to deliver 'gold standard' – and so help to keep that model in place.

It is important to:

- recognise multiple dimensions of heating lives
- recognise and promote diversity in methods of keeping warm and in uses of space
- recognise how infrastructures and practices co-evolve (not just consumer acceptance)